NYU Tandon School of Engineering

CS-GY 6083, Principles of Database Systems, Fall 2024
Prof Phyllis Frankl

HOMEWORK #2

Instructions:
You may discuss these problems with other students but should write up and hand in the solutions **yourself**. You should execute the SQL queries against the given sample data and/or additional data. Do not hand in the results of running the tests, but check them yourself and think about whether the results are correct.
Table definitions and sample data are in BrightSpace → Content→ GeneralInfo

There will be two GradeScope links for this assignment:

HW 2A: Hand in a **.txt** or **.sql** file with the queries SQL queries
Any text other than the queries should be commented out with "--" so the file can be imported and executed.

HW 2B: Hand in a **.pdf** with all problems, marking which is which, as usual. You may either typeset the RA and TRC queries or hand-write them neatly. And if you choose to type it in latex, pay attention to the issue of expressions that are too long to fit in one line.

For Problems 1 – 12 use the University Database, you can find University Database under BrightSpace → General Information → university_DDL and university_inserts

Note that your queries should work correctly on any data that could be in the tables, not just the particular data set provided.

1. Write a tuple relational calculus (TRC) query to find the ID and name of each student in the Comp. Sci. department

2. Write a relational algebra (RA) query to find the ID and name of each student in the Comp. Sci. department
3. Write an SQL query to find the ID and name of each student in the Comp. Sci. department

4. Write a TRC query to find the ID of each instructor who has taught CS-101 along with the year in which they taught it.
5. Write an RA query to find the ID of each instructor who has taught CS-101 along with the year in which they taught it.
6. Write an SQL query to find the ID of each instructor who has taught CS-101 along with the year in which they taught it.

7. Write a TRC query to find the ID and name of each instructor who has taught CS-101 along with the year in which they taught it.
8. Write a RA query to find the ID and name of each instructor who has taught CS-101 along with the year in which they taught it.
9. Write an SQL query to find the ID and name of each instructor who has taught CS-101 along with the year in which they taught it.

Problems 10 – 12 use material that will be covered in lecture 4:

10. Write an SQL query to find the total number of credits the student with ID 12345 has taken in Fall 2009. (Do not worry about whether they have a passing grade for the course.)
11. Write an SQL query to find the ID and total number of credits taken by each student in Fall 2009. (Do not worry about whether they have a passing grade for the course.)

12. Make up another question about the university data, write it in English, and write an SQL query to answer it. It should involve a join of at least two tables.

Using the Retailer Database (to be posted soon), write SQL queries for each of the following:

13. Find the productCode, productName and productLine of each product ordered by any customer who lives in the USA that has status “shipped”
14. Find the total payments made by each customer who lives in the USA. The result should include the customer’s customerNumber, customerName, and their total payments

15. For each productCode, list the productCode, productName, and the maximum profit on that product, i.e. the maximum difference between the buyPrice and the priceEach paid for ordered items of that product. You don’t need to list products for which there were no orders.